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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/824,429 | 04/15/2004 | Toshihiro Nakamura | 251873US-8CONT | 6502 |
| 22850 | 7590 | 05/03/2005 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | STAHL, MICHAEL J | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2874 | |

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/824,429

Applicant(s)

NAKAMURA ET AL.

Examiner

Mike Stahl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10, 11 and 19-21 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 22 is/are rejected.
- 7) ☒ Claim(s) 7, 9 and 12-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/15/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Election/Restrictions

In response to the restriction requirement mailed November 16 2004, applicant traversed the requirement on the basis that the examination of all the claims would not place a serious burden on the examiner. The examiner has reconsidered the requirement and has decided to examine all the claims together. The previous restriction requirement is thus withdrawn.

Drawings

Figure 6 is objected to because "virtrification" should be "vitrification".

Figures 8(a)-8(c) are each objected to because "preperation" should be "preparation".

Figure 8(c) is objected to because "keeiping" should be "keeping".

Claim Objections

Claim 12 is objected to because in lines 10-12, it appears that "temperature" should be "cooling speed", since temperature and cooling speed are different properties with different physical units. It is believed that applicant is referring to cooling the rod quickly enough to avoid crystal formation. Claims 13-18 are objected to by dependence from claim 12.

Claim 18 is additionally objected to because it is appears that "than" should be inserted after "smaller".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Kinoshita et al. (US 2002/0027703).

Kinoshita discloses an optical amplification fiber having a gain spectrum with a FWHM of at least 45 nm and a maximum value of power conversion efficiency of at least 80%. See fig. 21 (right hand column), fig. 24, [0155]-[0156], [0190].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 2-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 6490889).

As to claim 2, Zhang discloses a method for manufacturing rare earth element doped glass comprising the steps of depositing fine silica glass particles obtained by reacting a silica glass material and a co-dopant (a) obtained by reacting a raw material for the co-dopant (a) to prepare an aggregate of fine silica glass particles doped with the co-dopant (a); and immersing the aggregate in a solution containing the rare earth element and the co-dopant (b) for doping the rare earth element and the co-dopant (b) to the aggregate. See e.g. the abstract, col. 15 ln. 58 – col. 16 ln. 46; and Example 2 in col. 23. Zhang does not specifically disclose a fiber having a gain spectrum with a FWHM of at least 45 nm, and a maximum value of PCE of at least 80%. However, a fiber with arbitrary characteristics such as the recited FWHM and PCE values could obviously have been made by the method steps of Zhang. It would have been obvious to a skilled person at the time the invention was made to have used the teachings of Zhang to make such a fiber since Zhang teaches that the disclosed methods enable doping with higher concentrations and better uniformity than conventional methods (col. 3 lns. 10-25; col. 4 lns. 30-52; col. 5 lns. 18-47).

As to claim 3, co-dopants (a) and (b) may both be aluminum (col. 16 lns. 43-46; col. 21 ln. 63 – col. 22 ln. 15; Table III in col. 23), which is known to affect the gain spectrum and the energy conversion efficiency according to the present specification.

As to claim 4, a concentration of aluminum doped in the immersing step is less than 1.5 % by weight.

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As to claim 5, the concentration of aluminum doped in the depositing step exceeds that doped in the immersing step.

As to claim 6, the process further includes drying the aggregate after the immersing step, oxidizing at least one dopant provided in the immersing step, dehydrating the aggregate after the oxidization, and sintering the aggregate after the dehydration (col. 16 ln. 57 – col. 17 ln. 7).

As to claim 8, a crystal water contained in the co-dopant element doped in the immersing step is removed. It is noted that the dopant compounds of Table III include crystal water, and the water is driven off during the dehydration process.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tran (US 4519826).

Tran '826 discloses a method comprising drawing a glass rod which at least partially contains crystals (see e.g. claim 1). Note that a later reference by Tran (US 5160521) states that the preforms in '826 inherently include crystals (col. 1 lns. 41-53). Tran '826 does not specifically disclose a fiber having a gain spectrum with a FWHM of at least 45 nm, and a maximum value of PCE of at least 80%. However, a fiber with arbitrary characteristics such as the recited FWHM and PCE values could obviously have been made by the method steps of Tran '826. It would have been obvious to a skilled person at the time the invention was made to have employed the method of Tran '826 to make such a fiber since Tran '826 teaches that the disclosed fluoride-based glasses are more transparent (i.e. have less transmission loss) than silica-based glasses, and since the disclosed method avoids known problems with making optical fibers from fluoride-based glass.

Allowable Subject Matter

Claims 10-11 and 19-21 are allowed. Claims 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 12-18 will be allowable if the objections above are overcome.

As to claims 7 and 9, both claims require increasing the temperature from room temperature to a specified higher temperature at a specified rate. Claim 7 refers to the oxidization step, and claim 9 refers to the crystal water removal step. It is noted that the Zhang et al. reference applied to base claims 2 and 6 does not disclose a heating process which starts from room temperature for either the oxidization step or the dehydration step (see e.g. col. 16 lns. 57-67). There is no apparent motivation to modify the Zhang method by beginning either of these steps near room temperature.

As to claim 10, the references of record fail to disclose or suggest mechanically polishing a glass rod to a surface roughness of 0.5 microns or less, in combination with cleaning the polished rod and forming a glass layer on its outer surface. Claim 11 depends from claim 10.

As to claim 12, the references of record fail to disclose or suggest heating a glass rod containing crystals to a temperature higher than a glass formation temperature, and cooling the rod at a rate faster than a cooling speed at which crystals can be extracted from the glass. Tran (US 5160521) teaches creating a rod or preform in a way that avoids the formation of crystals in a glass rod in the first place. Beall et al. (US 6632758) discloses a method for making glass which intentionally includes crystals, but since the crystals are intentionally created, there would appear to be no motivation to apply the process of claim 12. Lastly it is noted that Kopylov et al.

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(US 5776222) discloses a method for removing bubbles or crystals in existing preforms, but the method does not involve the steps of claim 12. Claims 13-18 depend from claim 12.

As to claim 19, the references of record fail to disclose or suggest a glass rod partially containing crystals and a diameter of at least 5 mm, including a rare earth element and an aluminum compound, wherein the concentration of aluminum is at least 3.5 % by weight.

Yanagita (US 5070506) appears to be the closest reference of record, and discloses a glass rod having a diameter over 5 mm, the glass including aluminum and erbium (col. 12 lns. 15-37).

However, Yanagita teaches away from including any crystals in the glass, and the compositions are chosen to avoid crystallization (col. 1 lns. 48-64; col. 3 lns. 50-63; col. 4 lns. 31-35).

Accordingly claims 19-21 are considered allowable over the prior art of record.

Conclusion

The unapplied references listed on the attached PTO-892 form are considered relevant to this application.

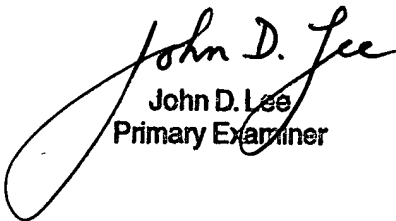
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official communications which are eligible for submission by facsimile and which pertain to this application may be faxed to 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be

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obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Stahl
Patent Examiner
Art Unit 2874

February 27, 2005



John D. Lee
Primary Examiner